6-2014

PPI-R: Factor Structure in a Diverse Subclinical Sample

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PPI-R: Factor Structure in a Diverse Subclinical Sample

by

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A Thesis submitted in partial satisfaction of
the requirements for the degree
Doctor of Philosophy in Clinical Psychology

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June 2014

Each person whose signature appears below certifies that this thesis in his/her opinion is adequate, in scope and quality, as a thesis for the degree Doctor of Philosophy.

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ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to Dr. Haerich, who has provided me with guidance, mentorship, and support throughout my graduate school career. I am thankful for his endless patience and enthusiasm, without which this thesis would not have been possible. I would also like to thank my members for their much appreciated advice and perspective, which has served to direct and refine the trajectory of this thesis.

To my family, your patience, humor, and understanding have been integral in my battle with graduate school. You have stood by me despite my limited time to devote to you all. I am thankful for my father's faith in me and delicious food that has sustained me throughout these years. To my mother, who is no longer here on Earth, I would like to express my deepest love and gratitude for her sacrifices and never-ending encouragement. I would also like to express a special thank you to my husband, who has never stopped believing I could accomplish anything, and who has provided me daily support through the trials and tribulations of graduate school colliding with life.

Lastly, but certainly not least, I would like to thank all my closest friends, some of whom were beside me during late night study sessions, and others who have patiently listened to my struggles. I could not ask for a better collection of partners in crime.

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ABBREVIATIONS

PPI-R	Psychopathic Personality Inventory – Revised
ME	Machiavellian Egocentricity
RN	Rebellious Nonconformity
BE	Blame Externalization
CN	Carefree Nonplanfulness
SOI	Social Influence
F	Fearlessness
STI	Stress Immunity
C	Coldheartedness
PCL-R	Psychopathy Checklist – Revised

ABSTRACT OF THE THESIS

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by

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Loma Linda University, June 2014
Dr. Paul E. Haerich, Chairperson

Literature examining the factor structure of the Psychopathic Personality Inventory – Revised (PPI-R) has yielded mixed results. This study attempted to examine the three proposed factor structures (one-, two-, or three-) for the PPI-R utilizing a mixed gender undergraduate sample. Results demonstrated poor fit for each of the three proposed factor structures within the present sample. Post-hoc exploratory factor analysis of the PPI-R items revealed that seven of the eight original subscales from the measure were found to be salient. Rebellious nonconformity was the only subscale that was not able to be extracted. Furthermore, only 81 out of the 131 measure items loaded saliently onto each factor. These findings suggest that subscale scores be utilized, in addition to factor scores, when measuring psychopathic traits, as expression of psychopathy may differ depending on sample characteristics.

CHAPTER ONE

INTRODUCTION

Specific Aims

Examinations of the psychopathy construct and its correlates have become a growing focus of theoretical and empirical research. Prior to the development and validation of appropriate measures to assess psychopathy, knowledge regarding this abnormal personality was based solely on observation and theoretical foundations. The Psychopathy Checklist (PCL) and revised version (PCL-R; Hare, 1991) were the first instruments created specifically for the purpose of measuring clinical psychopathy. The PCL-R has historically been used in incarcerated populations as the administration requires a semi-structured interview and file review. However, emerging research suggests that despite clinical psychopaths being more prevalent in incarcerated samples (Hare, 2006; Salekin, Rogers, Ustad, & Sewell, 1998), individuals who have not committed violent crimes and are living among the general population, have some level of psychopathic traits. Therefore, the construct of psychopathy is dimensional in nature as opposed to categorical. Psychopathy can be viewed as a continuum on which individuals will express varying degrees of the personality construct (Edens, Marcus, Lilienfeld, & Poythress, 2006).

In an attempt to extend the investigation of psychopathic personality to non-incarcerated samples, some researchers have developed scales specifically for the measurement of psychopathy in the general population. One of these, the Psychopathic Personality Inventory (PPI; Lilienfeld & Andrews, 1996) is a measure which has been empirically supported and demonstrates adequate internal consistency and appropriate

convergent/divergent validity. Though the PPI has been empirically examined in both incarcerated and nonincarcerated samples, its revision (PPI-R; Lilienfeld & Widows, 2005) has experienced fewer of such analyses. Factor analyses for the PPI and PPI-R have evidenced inconsistent results ranging from proposed one-factor to three-factor models. In the most recent study investigating the factor structure of the PPI-R, Anestis, Caron, and Carbonell (2011) reported poor fit for each model in their sample of total undergraduates with model fit improving with partial invariance for gender.

The aim of the present study is to examine the factor structure of the PPI-R using an undergraduate sample. Specifically, this study will attempt to confirm the fit of the one, two, and three-factor structures found in previous studies for the PPI-R. Furthermore, previous studies have all had greater than half of their participants identify as Caucasian within mixed gender and all male samples. The current study is unique in that its sample is a majority of non-Caucasian participants (e.g., Hispanic, Asian American, African American). Thus, the factor structure of the PPI-R reflects the expression of the construct within a diverse population. Appropriate follow up analyses, such as item level analysis, were conducted as necessary.

Background

The current understanding of psychopathy has been largely based on observations made by Hervey Cleckley (1988). He described psychopaths as having significant emotional deficits such as lacking empathy, guilt, remorse, and shame, experiencing low stress reactivity, and as having general poverty of affect. He also noted psychopaths as having poor interpersonal relationships characterized by superficial charm, deceitfulness,

manipulation, unreliability, and egocentricity. Furthermore, Cleckley's description included details of poor abilities to plan, lack of insight and judgment, failure to learn by experience, and antisocial tendencies.

Empirical research has also demonstrated links between psychopathy and the use of instrumental and indirect aggression (Glenn, & Raine, 2009; Vaillancourt, & Sunderani, 2011), poor passive avoidance (Newman, & Kosson, 1986; Newman, & Schmitt, 1998), attenuated fear potentiated startle (Justus, Finn, 2007; Levenston, Patrick, Bradley, Lang, 2000; Patrick, Bradley, & Lang, 1993; Vaidyanathan, Hall, Patrick, & Bernat, 2011), abnormal physiological responses to emotional stimuli (Patrick, Cuthbert, & Lang, 1994), impairments in identification of fear inducing behaviors and moral acceptance of such behaviors (Marsh, & Cardinale, 2012), and poor orientation of attention when engaged in goal directed behavior (Hiatt, Schmitt, & Newman, 2004; Newman, Schmitt, & Voss, 1997; Zeier, Maxwell, & Newman, 2009). Notably, clinical psychopathy is predictive of general and violent crimes, as well as recidivism (Hart, 1998; Hemphill, Hare, &Wong, 1998; Salekin, Rogers, & Sewell, 1996; Salekin, Rogers, Ustad, & Sewell, 1998). Individuals identified as clinical psychopaths have also evidenced poor to moderate success in treatment (Rice, Harris, & Cormier, 1992; Salekin, Worley, & Grimes, 2010).

Continuous Distribution of Psychopathy

As a result of the associated criminal impact, clinical psychopathy has been largely studied within samples of criminal offenders. In fact, base rates of clinical psychopathy within prisons have been estimated to be from 15-30% for male offenders

(Hare, 1995; Hare, 2003; Salekin, et al., 1998), with similar estimates (12-27%) reported for psychiatric hospitals (Cleckley, 1988). Such high base rates not only created ideal settings for the study of the construct, but also established a focus on the relationship between psychopathy and crime. However, emerging research has begun to support a dimensional, as opposed to taxonic, underlying construct of psychopathy, wherein traits of psychopathy, similar to any other pathology, exist at varying degrees along a continuum (Bishopp & Hare, 2008; Edens, Marcus, Lilienfeld, & Poythress, 2006). Research has also demonstrated a continuous distribution of psychopathic traits for different assessment measures and within lower order facets of psychopathy, including affective-interpersonal and impulsive-antisocial components (Marcus, John, & Edens, 2004; Guay, Ruscio, Knight, & Hare, 2007). Additional support of a dimensional construct of psychopathy is also evidenced by similar laboratory results for non-incarcerated individuals as seen in incarcerated populations (e.g., Dvorak-Bertsch, Curtin, Rubenstein, & Newman, 2009; Masui, & Nomura, 2011; Sadeh, & Verona, 2008).

Some researchers argue that despite the high base rates of clinical psychopathy in prisons and jails, the inclusion of a criminal record does not qualify one as a clinical psychopath because criminal behavior is not considered a core feature of the construct, but rather a correlate (Skeem, & Cooke, 2010). In other words, psychopathy is considered to be a personality disorder and any deviant behavioral components are the result of the abnormal personality, as opposed to a direct trait of psychopathy. As such, it stands to reason that individuals with psychopathic traits would also exist outside of the criminal justice system. The term, "successful psychopath", has been used to describe said individuals who demonstrate psychopathic traits and have not come into contact with

the legal system (Gao, & Raine, 2010; Mullins-Sweatt, Glover, Derefinko, Miller, Widiger, 2010). This is in conjunction with Cleckley's (1988) distinction between criminals and psychopaths. He theorized that people with psychopathic traits may exist within the population outside of legal systems and have the ability to thrive due to their charming and manipulative styles of interacting. Thus, the study of psychopathy outside of jails and prisons has been strongly supported by empirical and theoretical research, and has gained more interest over the recent years.

Structure of Psychopathy: PCL-R "Gold Standard"

The support for a continuous distribution of psychopathy, coupled with a desire to understand more regarding the etiology has led researchers to study psychopathic traits within non-incarcerated or general populations. The Psychopathy Checklist-Revised is considered to be the "gold standard" for assessing the construct of psychopathy (Marion & Sellbom, 2011). The PCL-R, and its original version (PCL), were developed to capture the interpersonal/affective traits of psychopathy in addition to commonly associated criminal/antisocial behaviors. Though the PCL-R has demonstrated good reliability and validity (Hare, 2003; Patrick, 2006), its focus on criminal behavior makes it unsuitable for use outside of criminal offender populations. More specifically, the PCL-R relies on norms gathered from a majority of incarcerated men, which would not generalize well to mixed gender, non-incarcerated individuals. Furthermore, the PCL-R also relies on an extensive two-hour semi-structured interview, review of criminal records, and specialized training for administration making it difficult to administer to large samples of people with no corroborating criminal records (Sandler, 2007).

Despite the PCL-R's inability to be used efficiently within non-incarcerated or general populations, it has been the reference measure for most other assessments of psychopathy, including self-report measures. Using the PCL-R (Hare, 1991), the construct of psychopathy was originally conceptualized as having two underlying facets described as the Interpersonal/Affective (Factor 1) and Social Deviance (Factor 2) factors. This construct of psychopathy was replicated many times and has provided the generally accepted understanding of psychopathy. However, more recent analyses of the PCL-R have identified slightly different underlying constructs of psychopathy. Cooke and Michie (2001) supported a 3-factor hierarchical model which identified psychopathy as a superordinate construct with 3 underlying correlated factors: the Arrogant and Deceitful Interpersonal Style, Deficient Affective Experience, and Impulsive and Irresponsible Behavioral Style. Their resulting conceptualization of psychopathy essentially split the original Interpersonal/Affective factor (Factor 1) of the PCL-R into two correlated factors, leaving Factor 2 (Social Deviance) more or less intact; meaning they excluded items in their Impulsive and Irresponsible Behavioral Style factor which were explicitly criminal in nature and that were originally included in the Social Deviance factor.

In a more recent analysis of the PCL-R, Hare (2003) proposed a four-factor construct to psychopathy including: an Interpersonal factor, Affective factor, Lifestyle factor, and Antisocial factor. He argued that the criminal items excluded from Cooke and Michie (2001) are clinically relevant and should not be excluded based on core features of the construct versus correlates. These four factors, in essence, break up the original two factors of Interpersonal/Affective and Social Deviance, into four separate but

intercorrelated factors. Replications of the three- and four-factor models have been supported in various populations (e.g., Morrissey, et al., 2010; Neumann, Kosson, Salekin, 2007; Vitacco, Rogers, Neumann, Harrison, Vincent, 2005; Weaver, Meyer, Van Nort, & Tristan, 2006).

The successful use and implementation of the PCL-R within offender samples promoted the development of self-report measures which are more cost effective and able to be administered to non-incarcerated individuals. Two such measures which were developed to mirror the two-factor structure of the PCL-R are the Self-Report Psychopathy Scale (SRP-II; Hare, Harpur, & Hemphill, 1989) and Levenson's Self-Report Psychopathy Scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995). Though both measures were created to have a two-factor structure and recent factor analyses have demonstrated modest support for the two-factor structure (Brinkley, Schmitt, Smith, & Newman, 2001), sometimes better construct fits for three- (LSRP) and four-factor (SRP-II) structures (Brinkley, Diamond, Magaletta, & Heigel, 2008; Williams, Paulhus, & Hare, 2007) have been reported. Because these two measures were developed with the two-factor PCL-R construct of psychopathy in mind, they may fail to capture important theoretical traits, or be overly inclusive of behavioral traits not necessarily considered core features of psychopathy. In contrast, the Psychopathic Personality Inventory (PPI; Lilienfeld, & Andrews, 1996) and its revision (PPI-R; Lilienfeld, & Widows, 2005) were based on theoretical and empirical assessment development as opposed to test construction focused on replicating the PCL-R structure.

Development of the PPI-R

In developing the PPI, Lilienfeld and Andrews (1996) sought to focus more on Cleckley's (1988) conceptualization of psychopathy, as opposed to the standard PCL-R conceptualization. The authors argued that including behavioral items in an assessment of psychopathy may not be sensitive enough to identify psychopathic traits (including clinical psychopathy) if antisocial tendencies were not present. Therefore, their approach to test construction was exploratory in nature with an emphasis on creating items to assess personality traits. The advantage to the exploratory approach is the ability to create a set of items which can be evaluated and revised for the appropriate capture of the construct, with the goal of ending with a set of items that best represents psychopathy. As such, Lilienfeld and Andrews were overly inclusive in their selection of personality constructs related to psychopathy which included a total of 24 principal constructs (e.g., superficial charm, guiltlessness, fearlessness, lack of planning, low ambition, lack of anxiety, manipulativeness, inability to form close attachments, lack of empathy and emotional depth, and unreliability).

Three rounds of item administration and collection were conducted in order to refine item selection based on factor loadings. Each round of PPI data collection and factor analyses yielded eight underlying factors: (1) Machiavellian Egocentricity is representative of self centered and aggressive tendencies in interpersonal relationships, (2) Social Potency assesses the ability to be charming and manipulative, (3) Coldheartedness is the tendency to be callous and unsentimental, (4) Carefree Nonplanfulness captures the lack of forethought and planning, (5) Fearlessness measures the lack of anxiety related to harm and propensity to take risks, (6) Blame Externalization

focuses on the inclination to blame others for one's difficulties and rationalizing personal contribution, (7) Impulsive Nonconformity measures lack of concern of social norms, and (8) Stress Immunity assess a general lack of anxiety.

Lilienfeld and Widows (2005) revised the PPI (PPI-R) in order to improve psychometric concerns while maintaining the strengths of the original measure. They reduced the reading level to the fourth grade, reworded culturally sensitive items, decreased its length by removing psychometrically weak items, and revised or added items used to detect response styles. Factor analysis of the revised measure again yielded eight underlying factors. The factors capture the same constructs as the original PPI and include two renamed factors: Rebellious Nonconformity (previously Impulsive Nonconformity) and Social Influence (previously Social Potency).

Factor Analytic Studies of the PPI/PPI-R

The investigation of psychopathy and its behavioral and emotional correlates depends greatly on the ability to adequately measure the psychopathy construct. As such, many researchers have attempted to explore and support various factor structures with the hopes of adequately representing how traits of psychopathy are represented within different populations.

From initial development of the PPI, Lilienfeld and Andrews (1996) sought out to create a measure which would include the core personality traits of psychopathy. The end result was an exploratory factor analysis that included eight subscales and one superordinate factor of psychopathy. Though the PPI was meant for a non-incarcerated population, and was created to solely measure personality traits, many researchers have

examined the factor structure within the context of a two-factor model corresponding to the traditional two-factor construct of Hare's PCL-R.

To date, at least three different factor structures of the PPI-R have been supported by factor analytic studies. Besides the original one-factor (superordinate) structure initially proposed by Lilienfeld and Andrews (1996), the traditional two-factor structure guided by the PCL-R, and a three-factor structure have all been explored. The inconsistencies found among the factor structures have promoted continued research in identifying the most valid structure for various populations.

Benning, Patrick, Hicks, Blonigen, and Krueger (2003) conducted an exploratory factor analysis (EFA) on the PPI subscales using male twins. Their analyses yielded three underlying factors to psychopathy with the Coldheartedness (C) scale being the only subscale to load on one factor. Because the third factor was solely characterized by C, they decided to extract only two factors from the data. This resulted in two factors which were similar to the initial extraction. Again, C did not load appreciably on either of the first two factors. Therefore, the authors conducted a third EFA without including C, and extracted only two factors, resulting in the best fit for the data. Factor 1 (Fearless Dominance) included the subscales Stress Immunity, Social Potency, and Fearlessness. Factor 2 (Self-Centered Impulsivity) contained Impulsive Nonconformity, Blame Externalization, Machiavellian Egocentricity, and Carefree Nonplanfulness. As indicated, C, which measures lack of empathy, was not included in the final structure of psychopathy.

Prior to exploring convergent and divergent validity of the PPI and related measures, Benning, Patrick, Salekin, and Leistico (2005) conducted an EFA on the

subscales of the PPI in order to examine the replicability of published factor structures. As was previously found in Benning, et al. (2003), factor extraction yielded three initial factors with C loading on its own factor. To create the best fit for the data, the authors removed C from the analysis and extracted two factors (Fearless Dominance and Self-Centered Impulsivity), which accounted for the most variance. Thus, results from Benning, et al. (2003) were replicated with a sample of male and female undergraduate students.

Neumann, Malterer, and Newman (2008) attempted to replicate Benning, et al.'s (2003) two-factor structure of the PPI using confirmatory factor analysis (CFA). They failed to find an acceptable fit for the two-factor solution with their sample of incarcerated males. Furthermore, their efforts to recover a two-factor solution in an EFA conducted similarly to Benning, et al. also failed to provide sufficient evidence for a two-factor structure. It should also be noted that in contrast to Benning, et al.'s results of C loading on its own factor, Neumann, Malterer, and Newman found that C and Carefree Nonplanfulness (CN) loaded most highly onto a third factor.

Although fewer studies have been conducted on the revised version of the PPI, results remain inconsistent. Lilienfeld and Widows (2005) conducted an EFA on the PPI-R, which yielded three factors. Similar to Benning, et al. (2003), the authors found two factors which were defined as Fearless Dominance and Self-Centered Impulsivity, in addition to C defining its own factor. In contrast to Benning, et al., Lilienfeld and Widows decided to keep C as a third factor due to its importance in defining the construct of psychopathy. However, the analysis also revealed that two subscales, Rebellious Nonconformity (RN) and Stress Immunity (STI), cross-loaded onto both Self-Centered

Impulsivity (SCI) and Fearless Dominance (FD). The authors made the decision to include the subscales on their respective factors based on interpretability and prior findings. Thus, RN was included with the SCI factor and STI was included with the FD factor.

Using a sample of psychiatric patients, the majority of which were considered forensic commitments, Edens and McDermott (2010) were able to support a two-factor structure of the PPI-R when excluding C from the analysis. In contrast, Uzieblo, Verschuere, Van den Bussche, and Crombez (2010) failed to find acceptable model fit for a two-factor structure of the PPI-R (using seven subscales with the exclusion of C) within a sample of male and female community members. The most recent factor analytic study of the PPI-R examined the one-, two-, and three-factor solutions proposed in previous studies using a mixed-gender sample of undergraduate students (Anestis, Caron, & Carbonell, 2011). The authors were unable to find acceptable fit for any of the three models. However, with partial gender invariance, the one-, and two-factor models improved significantly. These results may reflect, in combination with the general inconsistency across studies, a difference in construct structure across gender, sample, and ethnicity.

In summary, attempts to validate a consistent factor structure for the PPI and PPI-R have been unsuccessful. Only one study (Lilienfeld and Andrews, 1996) has supported the one-factor structure. The two-factor structure which excludes C has demonstrated more support, however, the exclusion of a core feature of psychopathy leads to questions regarding the appropriateness of this structure. Lastly, the three-factor structure has shown inconsistent results ranging from appropriate fit to poor fit. In addition, the

methods used to examine factor structure (EFA vs. CFA) have primarily relied on exploratory methods to confirm established structures, which undermine the ability to confidently support said structures. Based on the most recent study conducted by Anestis, Caron, and Carbonell (2011) it is possible that some structure inconsistency may be due to differences in expression of the construct across gender (i.e. partial gender invariance).

Because of the general inconsistency regarding factor structure across studies and the lack of focus on the PPI-R the present study sought to replicate Anestis, Caron, and Carbonell's (2011) results. This study will attempt to test the validity of the one-, two-, and three-factor structure of the PPI-R using CFA. Only two of the eight studies which have examined factor structure of the PPI/PPI-R utilized CFA despite their intentions of confirming the structure. However, CFA is more appropriate than EFA to test for factor structure validity due to its ability to test hypotheses, instead of exploring them. In addition, the inclusion of a sample which is primarily composed of minorities and mixed gender, will afford another opportunity to examine the factor structure within a population that has yet to be used. Lastly, if none of the proposed structures demonstrate good fit for the data, an item level analysis will be conducted to indicate whether item loadings on subscales may vary for this sample, ultimately contributing to poor structure fit.

CHAPTER TWO

METHODS

Participants

Participants included 67 (33 %) male (*M* = 19.72 years of age, *SD* = 2.07, range = 17-27) and 136 (67%) female (*M* = 20.05 years of age, *SD* = 3.04, range = 17-37) students enrolled in an introductory psychology or statistics course at private Christian universities in Southern California. The mean age of the present sample is younger than the mean age of the normative college/community sample for the PPI-R (*M* = 27.73, *SD* = 13.41). Data was collected as part of a larger study to examine attentional correlates of psychopathic traits. A total of 210 subjects participated in the larger study. However, four were dropped from the analyses as they did not complete the questionnaire, and three were removed due to high scores in deviant and virtuous responding, resulting in a sample size of 203. The sample reflects the predominantly minority population of the university (15.8% Caucasian, 34.5% Hispanic, 33.0% Asian American, 7.4% African American, 9.3% Other). All students were given course credit for their participation in the study.

Measure

Psychopathic personality traits were assessed by the Psychopathic Personality Inventory-Revised (PPI-R; Lilienfeld and Widows, 2005). The PPI-R is a 154-item measure based on a 4-point Likert-type scale (1 = false, 2 = mostly false, 3 = mostly true, 4 = true). The PPI-R yields an overall psychopathy score, eight content (subscale) scales, and four validity scales. The eight subscales are: Machiavellian Egocentricity (ME),

Rebellious Nonconformity (RN), Blame Externalization (BE), Carefree Nonplanfulness (CN), Social Influence (SOI), Fearlessness (F), Stress Immunity (STI), and Coldheartedness (C). The four validity scales include: Virtuous Responding (detection of positive impression management), Deviant Responding (detection of bizarre symptoms not consistent with a known psychopathology), Inconsistent Responding 15, and Inconsistent Responding 40 (detection of inconsistency of responses). Samples of test items include: "I am easily flustered in pressured situations", "I'm not good at getting people to do favors for me", "I've been the victim of a lot of bad luck", and "I enjoy seeing someone I don't like get into trouble". For a college/community sample, the PPI-R has demonstrated adequate internal consistency and test-retest reliabilities for total (α = .92, α = .93) and subscale scores (α = .78-.87, α = .82-.95), respectively.

Procedure

Participation in the study is voluntary and was advertised to introductory psychology or statistics students through their class as a means to meet class requirements or obtain extra credit. Online availability of participation timeslots was used in order to schedule interested students. Written consent for participation was obtained prior to the start of the study, wherein a summary of risks and benefits, and volunteer status, were explained to each student. Participants completed the assessment on a computer as part of a larger study examining attention. The computer based PPI-R has demonstrated similarly adequate internal and test-retest reliabilities as the paper format (Sandler, 2007). The attention task and PPI-R assessment were given in counterbalanced order across the series of student participants. The questionnaire takes

approximately 20 minutes to complete. Basic demographic information such as, age, gender, ethnicity, and handedness was collected.

Confirmatory Factor Analyses

Confirmatory Factor Analyses (CFA) was performed in order to test the fit of the one-, two-, and three-factor proposed models with the current data. The benefit of CFA analyses is the ability to engage in true hypothesis-testing as opposed to more descriptive or exploratory approaches. Visually, the graphical presentations of CFAs are uncomplicated and inspection can help in understanding the theory (Byrne, 2006). Squares on the figure indicate observed variables, or in this case, individual items or parcels. Circles represent latent variables, or the constructs. A beneficial aspect of CFA allows for factors to correlate based on theory, which can be used to confirm higher order or secondary factors. CFA is also useful when validating latent constructs, such as psychopathy, by including indirect associations with observable data. The most useful aspect of CFA is testing the fit of the model to the observed data, therefore validating the theory and testing against the population (Byrne, 2006). Testing the data against a population uses maximum likelihood estimation wherein CFA provides estimates in the model that were maximized to the point at which it is the most likely to be observed in the population again if data were obtained from the same population (Raykov & Marcoulides, 2006, p. 30). Using CFA in EQS also assists in improving the hypothesized model as the software gives suggestions about relationships to be added or deleted based on what will be most parsimonious with the population. However, for this particular

study theory was used as a guide to improve structure fit based on suggested loadings by the software program.

The tested models were overidentified models. An overidentified model was purposefully constructed to maximize degrees of freedom for the allowance of post hoc fittings in the model. In addition, the more degrees of freedom available the more power one has to assume the model is satisfactory (MacCallum, Browne, Sugawara, 1996). CFA procedures require large sample sizes. As a general rule, Kline (2011) suggested that the minimum ratio of cases (*N*) to the number of model parameters that require statistical estimates (*q*) be 10:1. For this study, the largest model (i.e., three-factor model) has 20 parameters, which would indicate a minimum of 200 participants which are necessary to provide valid results, thus this study meets the required participant assumptions in order to conduct a valid CFA.

The confirmatory factor analyses were performed using EQS 6.1. Model fit was assessed using χ^2, and the comparative fit index (CFI) as recommended by Kline (2011). Chi-square measures the degree of fit between the observed model and the population. A model that matches the population is a "good" fitting model and one in which the Chi-square statistic is *not* significant. The CFI compares the hypothesized model with the independence model, which can be conceptualized as the null model, wherein no relationships are present in the model. The higher the CFI, the more likely it is that the hypothesized model is better fitting to the data and population than the independence model. Values of CFI range up to 1.0 and any value $\geq .95$ is considered to be a "good" fitting model (Hu & Bentler, 1999). In addition, this study also examined the root mean square residual (RMSEA). Unlike the CFI, RMSEA is representative of badness-of-fit,

and highly dependent on sample size. Ideally, the smaller the RMSEA the better fit as less error is being unaccounted for. Brown and Cudeck (1993) recommend a RMSEA between .05 and .10.

The CFA was performed on parcels of items for two reasons: 1) the EQS software program requires item-parceling when large amounts of items are used, given that the PPI-R has 154 items, this amount would not comply with EQS capabilities, 2) parceling the data requires fewer participants and is more consistent with previous factor analytic studies. Furthermore, Nasser and Wisenbaker (2003) reported that parceled variables tend to result in a better model fit when sample sizes are large (less than 50 is problematic) and there are at least three parcels per factor. Yuan, Bentler, and Kano (1997) suggest creating parcels based on already established empirical knowledge regarding the indication of which items should be grouped together in a parcel. Thus, subscales of the PPI-R were used as parcels and represent manifest variables.

Data Analytic Procedures

For the examination of the proposed one-factor model all eight subscales were set to load onto the higher order factor of psychopathy (Figure 1). The two-factor model proposed by Benning, et al. (2003) will contain the two higher order factors (Fearless Dominance and Self-Centered Impulsivity), and seven subscales (Figure 2). Within this particular model, the two factors were not allowed to correlate as Benning, et al.'s result demonstrated no significant correlation between their factors even after allowing them to correlate with promax rotation. Social Influence, Fearlessness, and Stress Immunity were set to load onto Fearless Dominance. Machiavellian Egocentricity, Rebellious

Nonconformity, Blame Externalization, and Carefree Nonplanfulness were set to load onto Self-Centered Impulsivity. Coldheartedness was not included in this factor analysis. Finally, the three-factor model was represented by two higher order factors of Fearless Dominance and Self-Centered Impulsivity, and seven subscales (Figure 3). Just as in the two-factor structure, subscales were set to load onto Fearless Dominance and Self-Centered Impulsivity. However, in contrast to the two-factor model, the subscale Coldheartedness represented a third independent factor which was set to correlate to Fearless Dominance and Self-Centered Impulsivity. Parceled subscales for Fearless Dominance and Self-Centered Impulsivity remained the same as in the two-factor structure.

Possible modifications to the models based on the Wald and Lagrange statistics were considered. However, as previously noted, modifications were only made if there was a theoretical rationale for changes. Follow-up analyses were conducted at the item-level to examine how item-level functioning contributed to the proposed model fits. However, because the sample size in this study is not sufficient to produce appropriately valid results from an item-level analysis, only indications regarding the subscale structure of the PPI-R were gleaned and should be interpreted with caution.

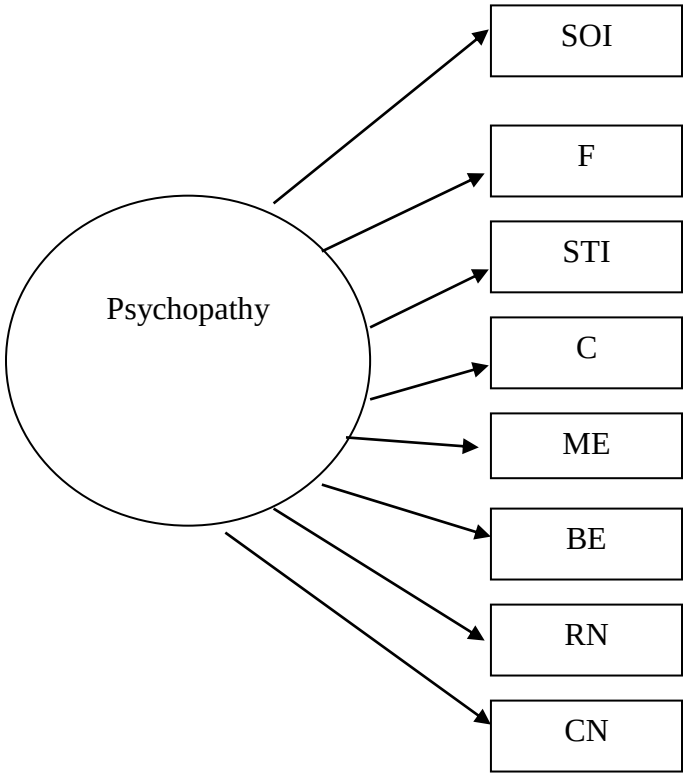

Figure 1. One-factor Structure Proposed by Lilienfeld and Andrews (1996). *Note*. C = Coldheartedness; ME = Machiavellian Egocentricity; RN = Rebellious Nonconformity; BE = Blame Externalization; CN = Carefree Nonplanfulness; SOI = Social Influence; F = Fearlessness; STI = Stress Immunity.

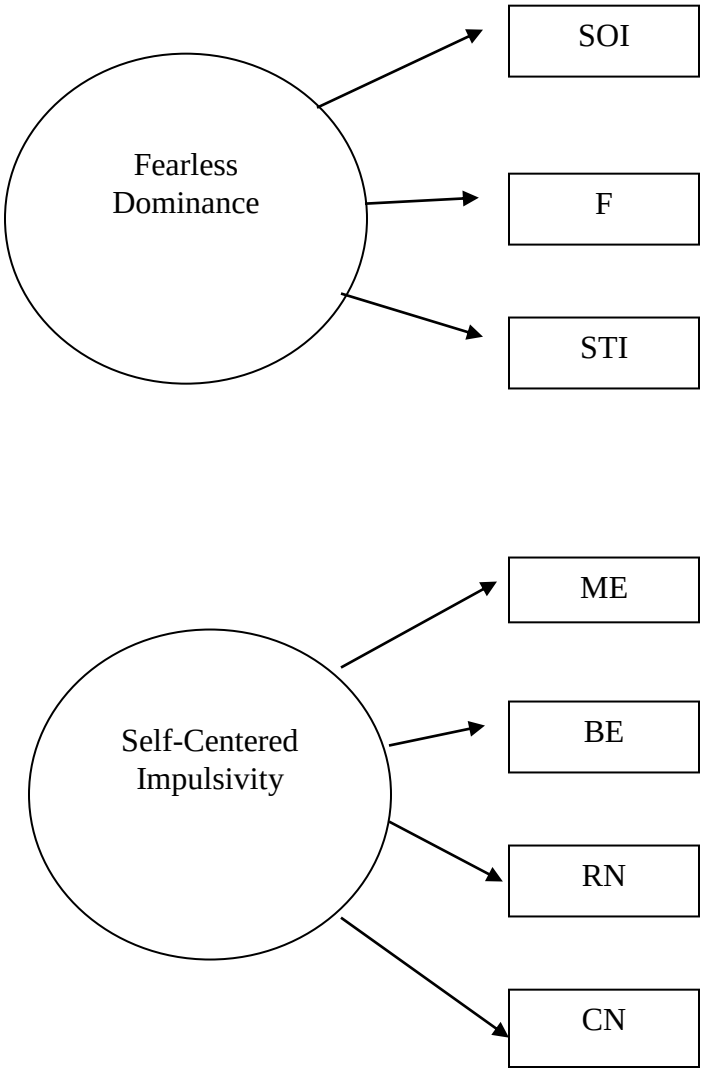

Figure 2. Two-factor structure proposed by Benning, et al. (2003). *Note***.** ME = Machiavellian Egocentricity; RN = Rebellious Nonconformity; BE = Blame Externalization; CN = Carefree Nonplanfulness; SOI = Social Influence; F = Fearlessness; STI = Stress Immunity.

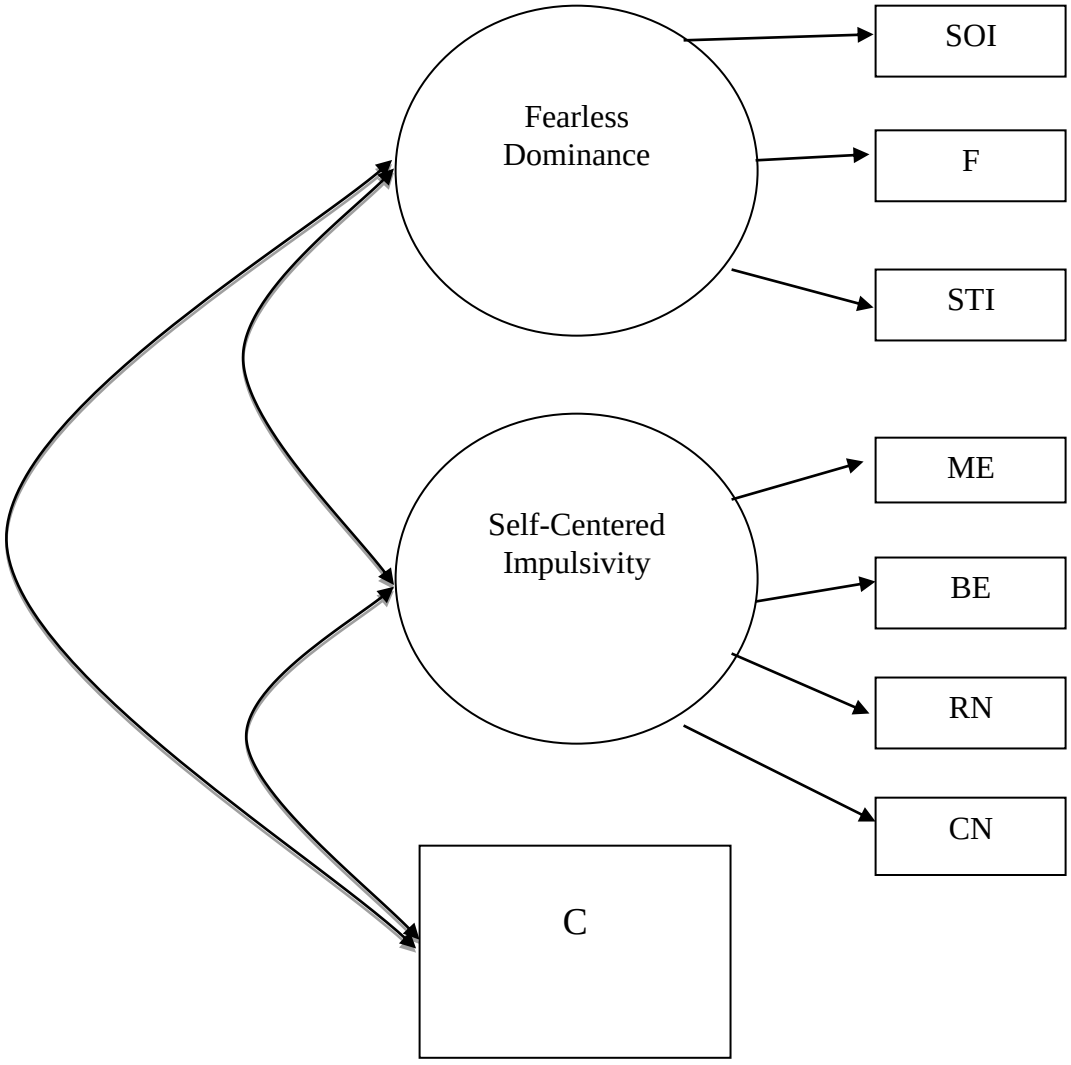

Figure 3. Three-factor Structure proposed by Lilienfeld and Widows (2005). *Note.* SCI = Self-Centered Impulsivity; FD = Fearless Dominance; C = Coldheartedness; ME = Machiavellian Egocentricity; RN = Rebellious Nonconformity; BE = Blame Externalization; CN = Carefree Nonplanfulness; SOI = Social Influence; F = Fearlessness; STI = Stress Immunity.

CHAPTER THREE

RESULTS

Descriptive statistics, correlations, and internal consistencies for PPI-R total scores and subscales are displayed for males and females in Table 1. Subscale and total score means and standard deviations were not statistically different from the Lilienfeld and Widows (2005) normative sample, however, it was noted that scores on Machiavellian Egocentricity, Social Influence, Stress Immunity, and Coldheartedness tended to be lower in the current sample of male students. Correlational analyses demonstrated that most subscales were significantly correlated with each other; with females displaying more significant correlations among subscales than males. Interestingly, Coldheartedness was the only subscale for both males and females which did not significantly correlate with any other subscale, despite its significant correlation to PPI-R total score. Significant differences in scores between males and females were evidenced for Carefree Nonplanfulness, Fearlessness, Machiavellian Egocentricity, Stress Immunity, and PPI-R total; with males demonstrating significantly higher scores than females. Total sample statistics are displayed in Table 2 and are largely similar to those reported for males and females. Notably, the Coldheartedness subscale for the total sample significantly correlated with Machiavellian Egocentricity ($r = .16$, $p < .05$) and Stress Immunity ($r = .17$, $p < .05$). Internal consistencies for the present total sample are comparable to those reported for the total sample of community/college subjects in Lilienfeld and Widows (2005).

Table 1

Descriptive Statistics and Correlations for Males and Females

	M	*SD*	*t*	α	C	ME	RN	BE	CN	SOI	F	STI	Total
C	30.64/29.36	6.47/6.21	1.36	.75/.72	-	.12	.03	.01	.14	.10	.00	.15	.33**
ME	43.27/39.55	9.06/8.55	2.86**	.82/.81	.19	-	.42**	.23**	.39**	.11	.19*	-.23	.56**
RN	32.88/32.73	7.32/7..32	.140	.79/.78	.11	.46**	-	.38**	.19*	.34**	.60**	.05	.76**
BE	31.34/30.12	6.86/7.37	1.14	.79/.80	-.23	.36**	.23	-	.20*	.09	.20*	-.17	.47**
CN	35.58/33.10	8.17/6.41	2.18*	.82/.75	-.02	.31**	.11	.07	-	-.20*	.04	-.20*	.33**
SOI	45.69/47.12	9.92/9.79	-.98	.87/.87	.07	-.04	.22	.10	-.61**	-	.29**	.35**	.58**
F	38.70/32.57	8.21/8.71	4.80**	.81/.83	-.14	.12	.53**	.12	-.14	.14	-	.28**	.67**
STI	33.99/31.26	6.96/6.92	2.63**	.82/.82	.16	-.18	.06	-.18	-.48**	.49**	.27*	-	.30**
Total	292.09/275.81	27.69/31.58	3.59**	.85/.89	.29*	.65**	.78**	.42**	.06	.43**	.54**	.31**	-

Note: *M* = mean; *SD* = standard deviation. For *M*, *SD*, and α, male scores are before the slash, females after. For the correlations, males are below the diagonal, females above.*$p < .05$. **$p < .01$. C = Coldheartedness, ME = Machiavellian Egocentricity, RN = Rebellious Nonconformity, BE = Blame Externalization, CN = Carefree Nonplanfulness, SOI = Social Influence, F = Fearlessness, STI = Stress Immunity.

Table 2

Descriptive Statistics and Correlations for Total Sample

	M	*SD*	α	C	ME	RN	BE	CN	SOI	F	STI	Total
C	29.78	6.31	.73	-	.16*	.06	-.06	.09	.09	-.01	.17*	.33**
ME	40.78	8.87	.82	-	-	.43**	.28**	.38**	.04	.22**	-.17*	.60**
RN	32.78	7.31	.78	-	-	-	.33**	.16*	.30**	.55**	.05	.74**
BE	30.52	7.21	.78	-	-	-	-	.16*	.09	.19**	-.15*	.46**
CN	33.92	7.12	.78	-	-	-	-	-	-.37**	.03	-.27**	.26**
SOI	46.65	9.83	.87	-	-	-	-	-	-	.21**	.38**	.50**
F	34.60	9.00	.84	-	-	-	-	-	-	-	.31**	.66**
STI	32.16	7.04	.82	-	-	-	-	-	-	-	-	.34**
Total	281.18	31.24	.89	-	-	-	-	-	-	-	-	-

Note: *M* = mean; *SD* = standard deviation. *$p < .05$. **$p < .01$. C = Coldheartedness, ME = Machiavellian Egocentricity, RN = Rebellious Nonconformity, BE = Blame Externalization, CN = Carefree Nonplanfulness, SOI = Social Influence, F = Fearlessness, STI = Stress Immunity.

Confirmatory Factor Analysis

Model Factor loadings for all three structures are displayed in Table 3. The one-factor model proposed by Lilienfeld and Andrews (1996) was tested first and can be found in Figure 1. Confirmatory factor analysis demonstrated a poor fit for this model: χ^2 = 173.90 (*df* = 20, *p* <.01), CFI = .501, RMSEA = .194 (90% confidence interval [CI] = .17, .22). The two-factor model proposed by Benning, et al. (2003) was tested next (Figure 2). Again, the model displayed lack of adequate fit: χ^2 = 168.25 (*df* = 14, *p* <.01), CFI = .476, RMSEA = .232 (90% CI = .20, .26). The proposed three-factor model by Lilienfeld and Andrews (1996) was tested last. This model did not provide an adequate fit: χ^2 = 172.22 (*df* = 18, *p* <.01), CFI = .500, RMSEA = .204 (90% CI = .18, .23). Examination of robust statistics did not significantly improve the fit indices for any models.

Table 3

Confirmatory and Exploratory Factor Analyses Factor Loadings

	One-Factor Model	Two-Factor Model		Three-Factor Model		Two-Factor EFA	
		Fearless Dominance	Self-Centered Impulsivity	Fearless Dominance	Self-Centered Impulsivity	Impulsive Assurance	Self-Centered Risk-Taking
BE	.35		.40		.38		.40
CN	.15		.44		.46	.60	
ME	.45		.79		.83		.58
RN	.94		.53		.49		.84
C	.06			.21	.21		
F	.58	.42		.31			.56
SOI	.32	.51		.38		.59	
STI	.08	.75		1.00		.61	

Note: BE = Blame Externalization, C = Coldheartedness, CN = Carefree Nonplanfulness, F = Fearlessness, ME = Machiavellian Egocentricity, RN = Rebellious Nonconformity, SOI = Social Influence, STI = Stress Immunity.

Post-hoc Analyses

Wald and Lagrange test statistics were inspected to inform possible modifications to the three models. Examination of these statistics suggested that parameters be added between variable errors. Modifying the models to include these suggested parameters is theoretically valid, however, the same theoretical rationale for adding one error should be applied to all conditions in which it is relevant. In these particular models, the large amount of additional parameter suggestions leads one to consider whether these additions to the models are indications that a new model is needed for this particular sample or that there may be different or additional factors warranted. Therefore, post-hoc additions to these models were not made.

Exploratory factor analysis was completed in an attempt to recover a three- or two-factor structure for the eight subscales. Principle axis factor analysis with varimax rotation revealed a two factor structure with Stress Immunity, Social Influence, and Carefree Nonplanfulness loading onto one factor and Rebellious Nonconformity, Machiavellian Egocentricity, Fearlessness, and Blame Externalization loading onto the second factor. The first factor was renamed Impulsive Assurance and the second factor was renamed Self-Centered Risk-taking. Similar to Benning, et al. (2003), Coldheartedness did not load appreciably onto either factor (Table 3). Notably, the factors these subscales load onto are slightly different than those reported in the PPI-R manual and some empirical research. Fearlessness was grouped with subscales which have traditionally been loaded onto Self-Centered Impulsivity, and Carefree Nonplanfulness loaded onto the traditional Fearless Dominance factor.

An item-level exploratory factor analysis was conducted to investigate possible indications of underlying subscale structures that may be contributing to poor fit. Principle axis factor analysis with varimax rotation was employed, and items with loadings of .30 or higher were retained. In order to ensure that extraction of factors was not constrained to a maximum of eight factors, an initial 10 factors were extracted from the 131 items which made up the subscales (excluding validity scale items). Salient factors did not emerge until seven factors were extracted. Items which cross-loaded significantly or did not appreciably load onto factors were excluded from the final factors. A total of 81 items loaded saliently onto the seven factors. Table 4 displays item factor loadings onto the seven factors. Generally, the factors which emerged were representative of the eight subscales originally developed. In other words, items that

loaded saliently onto each factor were commensurate with the items that were proposed as loading onto each factor. However, a Rebellious Nonconformity factor did not emerge with the present analysis, despite the remaining seven subscales being represented by a reduced number of items.

Factor one contained items which were primarily representative of Social Influence, in addition two items originally proposed as loading onto Carefree Nonplanfulness and Rebellious Nonconformity. Likewise, Factor two contained items related to Fearlessness with four items from the original Rebellious Nonconformity subscale loading saliently as well. Machiavellian Egocentricity items made up the majority of Factor 3 with two items from the Rebellious Nonconformity subscale included. All items loading saliently onto Factor 4 were representative of Blame Externalization. Similarly, Factor 5 contained only Stress Immunity items, Factor 6 contained only Carefree Nonplanfulness items, and Factor 7 retained only Coldheartedness items. It should be emphasized that the majority of the factors which emerged were simply shortened factors of the already proposed subscales with Rebellious Nonconformity demonstrating the most variability across factor loadings.

Table 4
Item-level Exploratory Factor Analysis Loadings

	SOI	F	ME	BE	STI	CN	C
21. I find it hard to make small talk with people I don't know well	.58						
78. It's easy for me to go up to a stranger and introduce myself	.57						
22. I'm not good at getting people to do favors for me	.56						
43. In conversations, I'm the one who does most of the talking	.54						
63. The opposite sex finds me sexy and appealing	.53						
113. I hardly ever end up being the leader of a group	.53						
56. I like to stand out in a crowd	.51						
68. I get embarrassed more easily than most people	.45						
41. People are impressed with me after they first meet me	.45						
108. I push myself as hard as I can when I'm working **(CN)**	-.44						
85. When people are mad at me, I usually win them over with my charm	.41						
135. It bothers me to talk in front of a big group of strangers	.41						
46. I feel sure of myself when I'm around other people	.40						
2. When I meet people, I can often make them interested in me with just one smile	.39						
65. I have a hard time standing up for my rights	.38						
58. I like to dress differently from other people **(RN)**	.36						
148. I am a daredevil		.69					
47. Parachute jumping would really scare me		.60					
3. Dangerous activities like skydiving scare me more than they do most people		.59					
137. If I were a firefighter, I would like the thrill of saving someone from the top of a burning building		.56					
12. I would find the job of a movie stunt person exciting		.54					

Note: BE = Blame Externalization, C = Coldheartedness, CN = Carefree Nonplanfulness, F = Fearlessness, ME = Machiavellian Egocentricity, RN = Rebellious Nonconformity, SOI = Social Influence, STI = Stress Immunity.

	SOI	F	ME	BE	STI	CN	C
57. It would be fun to fly a small airplane by myself		.52					
126. Sometimes I do dangerous things on a dare		.52					
93. I agree with the motto, "If you are bored with life, risk it"		.52					
36. I might like to travel around the country with some motorcyclists and cause trouble **(RN)**		.51					
104. I like my life to be unpredictable and surprising **(RN)**		.50					
25. It might be exciting to be on a plane that was about to crash but somehow landed safely		.45					
35. I like (or would like) to play sports with a lot of physical contact		.43					
69. High places make me nervous		.42					
4. I have always seen myself as something of a rebel **(RN)**		.37					
79. I would not like to be a race-car driver		.31					
33. I could be a good "con artist"			.53				
154. If I can't change the rules, I try to get others to bend them for me			.52				
61. In school or at work, I try to "stretch" the rules just to see what I can get away with			.52				
55. I'll break a promise if it's too hard to keep			.49				
23. I get mad if I don't receive special favors I deserve			.45				
132. I tell people only the part of the truth they want to hear			.44				
147. To be honest, I try not to help people unless there's something in it for me			.44				
11. I tell a lot of "white lies"			.43				
45. to be honest, I believe that I am more important than most people			.42				
80. I don't care about following the "rules"; I make my own rules as I go along **(RN)**			.40				
67. I enjoy seeing someone I don't like get into trouble			.38				
14. I've never cared about society's "values of right and wrong" **(RN)**			.36				
92. I sometimes lie just to see if I can get someone to believe me			.36				

Note: BE = Blame Externalization, C = Coldheartedness, CN = Carefree Nonplanfulness, F = Fearlessness, ME = Machiavellian Egocentricity, RN = Rebellious Nonconformity, SOI = Social Influence, STI = Stress Immunity.

	SOI	F	ME	BE	STI	CN	C
144. Some people have made up stories about me to get me in trouble				.69			
122. People I thought were my "friends" have gotten me into trouble				.68			
62. I've often been betrayed by people I trusted				.57			
84. I've been the victim of a lot of bad luck				.54			
134. I get blamed for many things that aren't my fault				.51			
90. Some people have gone out of their way to make my life difficult				.49			
112. I'm sure some people would be pleased to see me fail in life				.49			
18. A lot of people have tried to "stab me in the back"				.48			
60. People "rake me over the coals" for no good reason				.45			
100. I feel that life has treated me fairly				.37			
40. When I'm with people who do something wrong, I usually get the blame				.34			
10. I am easily flustered in pressured situations					.62		
141. I'm the kind of person who gets "stressed out" pretty easily					.58		
28. I tend to get crabby and irritable when I have too many things to do					.57		
76. I get stressed out when I'm "juggling" too many tasks					.55		
119. I worry about things even when there's no reason to					.52		
140. I can remain calm in situations that would make many other people panic					.49		
118. I don't get nervous under pressure					.46		
32. I don't let everyday hassles get on my nerves					.44		
96. I function well under stress					.42		
121. When I am doing something important, like taking a test or doing my taxes, I check it over first						.55	
88. I am careful when I do work that involves detail						.54	

Note: BE = Blame Externalization, C = Coldheartedness, CN = Carefree Nonplanfulness, F = Fearlessness, ME = Machiavellian Egocentricity, RN = Rebellious Nonconformity, SOI = Social Influence, STI = Stress Immunity.

	SOI	F	ME	BE	STI	CN	C
89. I've thought a lot about my long-term career goals						.52	
130. I think long and hard before I make big decisions						.51	
111. I haven't thought much about what I want to do with my life						.46	
101. I f I do something that gets me in trouble, I don't do it again						.45	
123. I often put off doing fun things so I can finish my work						.41	
145. I watch my finances closely						.40	
143. I usually think about what I'm going to say before I say it						.36	
109. I get very upset when I see photographs of starving people							.49
9. At times, I worry that I have hurt the feelings of others							.47
110. Ending a friendship is (or would be) very painful for me							.46
53. I often feel guilty about small things							.42
120. I do favors for people even when I know I won't see them again							.42
153. I often place my friends' needs above my own							.41
27. A lot of time, I worry when a friend is having personal problems							.37
71. It would break my heart to see a poor or homeless person walking the streets at night							.35

Note: BE = Blame Externalization, C = Coldheartedness, CN = Carefree Nonplanfulness, F = Fearlessness, ME = Machiavellian Egocentricity, RN = Rebellious Nonconformity, SOI = Social Influence, STI = Stress Immunity.

CHAPTER FOUR

DISCUSSION

The present study tested three proposed factor models for the PPI-R using confirmatory factor analysis. A one-factor model originally proposed by Lilienfeld and Andrews (1996), which had all eight subscales loading onto a total psychopathy score, did not fit the present sample adequately. The two-factor model, which excludes Coldheartedness and forces the remaining seven subscales to load onto a Fearless Dominance and Self-Centered Impulsivity factor, was also not a good fit. Lastly, the three-factor model that includes Coldheartedness as a third factor, in addition to Fearless Dominance and Self-Centered Impulsivity, did not demonstrate appropriate fit. These results replicate the poor fit for all three models also reported in Anestis, Caron, and Carbonell (2011) in their sample of mixed gender, Caucasian, undergraduates.

An attempt to recover a two- and three-factor model using exploratory factor analysis was somewhat successful. The two-factor model with Coldheartedness excluded was supported however, the Carefree Nonplanfulness and Fearlessness subscales were found to load on the opposite factors than originally proposed. Carefree Nonplanfulness was found to load with Social Influence and Stress Immunity, which reflected aspects of personality which may be viewed as socially acceptable. For example, individuals who tend to be successful are usually viewed as extroverted, personable, spontaneous, and less anxious. In contrast, the second recovered factor was represented by Blame Externalization, Machiavellian Egocentricity, Rebellious Nonconformity, and Fearlessness. These traits may be viewed as more negative in nature as individuals with these traits would be more egocentric in their relationships, blame others for their own

misgivings, take more risks, and disregard social norms; traits which are generally not reinforced. Thus, these new factors were renamed Impulsive Assurance and Self-Centered Risk-Taking.

Overall, the present sample demonstrated similar subscale and total scores to the normative sample (Lilienfeld & Widows, 2005). However, reliabilities for this sample were slightly lower than those reported in the manual and may reflect a significant difference in sample size, as the normative sample was near 1,000 participants and the current sample is 203. In addition, moderate to strong correlations between subscales were found, however when the sample was split by males and females, Coldheartedness was not found to be correlated with any other subscales, with the exception of a moderate correlation to the total psychopathic trait score. This finding is consistent with exploratory factor analyses which demonstrate that Coldheartedness fails to load saliently on any factors and yet remains a core component of the psychopathy construct (Benning, et al., 2003; Neumann, Malterer, & Newman 2008). Thus, Coldheartedness may not hold strong relationships with other common traits of psychopathy when presented singularly, yet when those traits are taken as a whole, Coldheartedness becomes a more important aspect. Therefore, the suggestion of Benning, et al. (2003) to exclude Coldheartedness from the factor structure of psychopathy is not wholly warranted as it remains a principal construct under the umbrella of psychopathy.

Examination of scores demonstrated that males tended to have higher total and specific subscale scores than females; a finding that is consistent with previous research (Anestis, Caron, & Carbonell, 2011). Males scored higher on subscales measuring impulsivity, risk-taking, lack of anxiety, and selfish and grandiose tendencies. These

differences likely reflect fundamental differences in traditional traits which define males and females. Males tend to be more behaviorally expressive (i.e. risk-takers, impulsive) and Machiavellian in nature, whereas females are generally more anxious and worried about bodily injury (Krampen, Effertz, Jostock, Müller, 1990). These differences in subscale scores may contribute to the poor fit of the three tested models as males and females may express psychopathic traits in qualitatively and quantitatively different ways. Furthermore, factor analyses of the PCL-R for clinically psychopathic females have revealed psychometrically different structures for psychopathy than those supported for males. In one study, Factor one of the PCL-R was found to have the same item loadings for males and females and was representative of the expected callous, unemotional traits. However, Factor two of the PCL-R, which traditionally manifests as high risk-taking and impulsive behaviors in males, was better characterized by sexual promiscuity, early behavioral problems, and irresponsibility in females. Moreover, many of the Factor two items on the PCL-R were found to cross-load across the two factors suggesting poor distinction between the two separate, but related, factors in females (Salekin, Rogers, & Sewell, 1997). These studies suggest that a similar difference may exist within the subclinical population as well, and may account for the poor fit found among CFA analyses with mixed gender samples.

Cultural influence should be considered when interpreting the results of the present sample. Unlike the majority of studies conducted to explore psychopathic traits, the present sample was made up of primarily Hispanic and Asian American participants. These cultures tend to be more collectivistic in nature and encourage strong conformity to rules and familial values. Thus, the inability to recover a Rebellious Nonconformity

factor in the present sample may be viewed as a result of a strong impact of cultural factors. Furthermore, these same cultural factors may have impacted the understanding of items ultimately reducing the number of items within each factor. In addition, the conservative Christian environment of the universities may have contributed to differences in expression of psychopathic traits as high moral values are important and highly encouraged. Review of the items that contribute to the Rebellious Nonconformity factor revealed that many of the items were specific to superficial forms of nonconformity, such as having radical political views, wearing clothing that attracts attention, or affiliating with extreme groups. Such examples of nonconformity are unlikely to be captured in a sample of undergraduates with strong Christian values, as nonconformity may be better manifested as straying from said values (e.g. disobeying parental rules, smoking/drinking, sexual experiences), as opposed to evidencing social nonconformity. These types of items, again, do not seem to capture the culture of the Christian environment and may be better suited for a more secular setting in which exploration of extreme values is more acceptable. Literature also suggests that strong religious values act as protective factors against engaging in delinquent or risky behaviors and actually promote pro-social behavior, thus rebellious nonconformity may be a difficult construct to measure in religious samples when normed on non-Christian samples (Scales & Leffert, 2004).

As with most studies, the present study has noted limitations. The most prominent limitation is the current sample size. Though the minimum number of cases to complete a confirmatory factor analysis was obtained, having larger sample sizes increases variability and validity of results. Furthermore, with a larger sample size, the

appropriate gender and possible ethnic statistical invariances could have been tested, lending greater support to the conclusion that differences in structural models occur as a result of sample differences. In addition, it was noted that a part of the sample appeared to speak English as a second language, which could possibly have affected the present results, especially with regard to the item-level analysis. It should be emphasized again that the item-level analysis was merely conducted to examine indications of subscale differences and therefore should be interpreted with caution as larger sample sizes could reflect substantially different results.

In summary, the one-, two-, and three-factor structures of the PPI-R did not reflect appropriate fit in the present sample. It appears that possible gender and cultural factors may contribute to poor fit as the separation of the mixed gender sample revealed differences between male and female scores on some subscales and total score of the PPI-R. Furthermore, Coldheartedness does not appear to correlate well with other subscales, yet contributes greatly to the construct of psychopathy as a whole. Lastly, future factor analytic studies should consider testing factor structures of the PPI-R within homogenous samples that have yet to be examined in order to elucidate how demographic variables contribute to the expression of psychopathy.

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APPENDIX A

INFORMED CONSENT FORM

LOMA LINDA
UNIVERSITY

Paul Haerich, Ph.D
Professor
(909) 558 8707
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Department of Psychology
School of Behavioral Health
Loma Linda University
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Informed Consent Document
For
Attentional Control and the Impact of Distractors During Matching Tasks
Principal Investigator: Paul Haerich, Ph.D.

Purpose and Procedures

We conduct research studies, such as this one, in order to further our knowledge of human behavior, the capabilities of the human mind, and the way humans perceive and respond to stimuli in the environment. We also are concerned that you find your experience to be rewarding and educational. Therefore, we wish to keep you fully informed of the procedures and stimuli involved. One way we do this is by describing the procedures to you and answering any questions you may have. The other way we do this is by using this document.

You are invited to participate in this research study as an adult member of society to help us better understand how people maintain attention to complete a task and how distractions are able to capture attention.

During this study you will be asked to indicate whether two letters or two numbers are the same or are different. The basis of the match will change from one sets of items to the next. For example, you may indicate if, two numbers match because both numbers are even or both numbers are odd. Or, the numbers might match because they are either greater than 5, or both less than 5. Or, the numbers might match because they are the same number, that is, both are the number 2.

On each trial you will first see an X in the center of the screen. This X will be replaced by an image, patch of color, or a word in the center of the screen with the two letters (or numbers) on either side. Your task is to ignore the image, patch of color, or word, and indicate as quickly as possible (while still being accurate) if the two letters (or numbers) match. The trials will be presented in sets of 60. After a set of 60 trials, you will have a short break and the experimenter will let you know what a "match" will be for the next set of trials. The experimenter will also let you know how many sets of trials there are.

The series of images presented on trials will include pictures of animals, guns, household objects, human nudes, nature scenes, mutilations, plants, rocks, snakes, spiders, sports scenes, etc. After the matching task, you will be given the opportunity to rate each image you saw using a computer-based rating-questionnaire. The experimenter will provide you with the specific instructions for these ratings.

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5110071 **Chair** R L Rydquist

You will also be asked to complete a computerized series of questions regarding your personality, experiences, and opinions.

The brain is connected to the rest of the body. While this may seem like an obvious statement, it means that we can monitor physiological responses like your pulse and slight changes in the amount of sweat produced at your finger tips to get additional information on how the brain responds to and processes information while you are participating. In this study, you will have two small, button-like sensors taped to the tips of the first and third fingers of your non-dominant hand to measure changes in sweat production (also called skin conductance). A pulse monitor will be clipped over the middle finger.

In addition to monitoring pulse and skin conductance, we may also wish to measure the electrical activity of your brain as you view the images and perform the recognition task. We will ask you to wear a net of up to 256 sensors that measure the electroencephalogram (or EEG) commonly referred to as brain waves. Each sensor acts like a microphone which picks up the small electrical signals produced by the brain cells. The entire sensor net has been soaked in a salt-water solution to improve the electrical connection from the scalp to each sensor. After the net has been applied, we may take a picture with a special camera that will let the computer know exactly where each of the sensors is in 3-D space.

The experimenter will explain the specific parts of this study in which we are asking you to participate, including the instructions for the matching task and which of the physiological measures will be included.

We encourage you to ask questions of the experimenter about the instructions or any aspect of the task(s) or recording methods.

You are free to discontinue your participation without negative consequences at any time simply by letting the experimenter know that you wish to do so. That is, you will receive participation credit whether or not you complete the session today.

When you signed up for the timeslot to participate in this study, you received information on the duration for your participation. The total time for your participation will be either 60 or 90 minutes; the experimenter will confirm the duration with you before you begin.

Risks

The images described above that are used in this research study have been selected to produce a wide range of responses. Although the content is similar to what might be seen on some television channels (for example, the Discovery Channel), you may feel uncomfortable while viewing these images.

None of the stimuli or procedures used in this research poses a risk which is greater than that expected in everyday life. Therefore, the committees at Loma Linda University (Institutional Review Board), and La Sierra University (Institutional Review Board) that review human studies have determined that participating in this study exposes you to minimal risk. The official stamp appearing on this form indicates this approval.

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Benefits

As is typical of basic research studies such as this, there are no direct benefits to you which will result from your participation in the study other than the educational experience of participating in a scientific psychological research project.

We anticipate that the results of this study will be of use in advancing the understanding of how the human mind works. Specifically, we expect the results will help us understand how the brain processes information, attends to targets and how attention may be captured by distracting information of various types in the environment and the cognitive mechanisms involved. Eventually, we anticipate that this information will aid in the understanding and treatment of disorders of mood and personality.

Compensation

Although not a benefit from the research study itself, you may receive extra credit for a course. The amount of extra credit points depends on whether you signed up for a 60- or 90-minute research study. If you are a student at LLU, you may receive 12 or 18 credit points for your class. If you are a student at LSU, you will receive 1 or 2 credits for your class. You will receive your credit via the SONA system which you used to sign up for this research study.

Confidentiality

All of the information gathered during your participation in this research study is both anonymous and confidential. No public presentation or any publication resulting from this study will disclose your identity. Your name will not be reported with your responses. All data will be reported in group form only.

If you have any questions regarding this study, we will be happy to answer them.

Participant's Rights and Third-Party Contacts

Because we wish to ensure that your participation is voluntary, we want to assure you that you may terminate at any time merely by telling the experimenter that you wish to do so. You will receive credit even if you decide to discontinue your participation before the test session is over.

Please feel free to ask any questions that you may have about this experiment at any time. Any questions that you may have at a later date may be directed to Paul Haerich, Ph.D., Department of Psychology, Loma Linda, CA 92354 (phone: 909-558-4707; email: participation@pehclab.org).

If you wish to contact an impartial third party not associated with this study regarding any complaint or questions about the study, you may contact the Office of Patient Relations, Loma Linda University Medical Center, Loma Linda, CA, 92354 (phone: 909 558 4647; email: patientrelations@llu.edu).

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Consent Statement

I have read the contents of the consent form and have been given the opportunity to ask questions concerning the study. I have been offered a copy of this form. I acknowledge that I am at least 18 years of age. I hereby give my voluntary consent to participate in this study. Participating in this research study does not waive my rights nor does it release the investigators or institution(s) from their responsibilities. I may call Paul Haerich, Ph.D at (909) 558-4770 if I have any additional questions or concerns.

Research ID Number as Signature / Date

I have reviewed this consent document with the person signing above. An opportunity has been provided to ask any questions regarding this document and the research described in it.

Investigator Signature / Date

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5110071 Chair R L Rugbyrnd